4. Planting and Trans-planting equipment

Planting equipment is equipment used to place seeds in the soil for germination. It must be properly adjusted so the right amount of seed is planted at the proper depth in the soil. Planting equipment includes planters and drills.

Planters
A planter is an implement used to place seeds in the soil at the proper rate, depth, and spacing.

The planter opens a small furrow, drops and covers the seeds, and lightly compacts the soil over the seeds.

Corn, cotton, and many vegetable crops are planted with planters.

Before this machine was invented, farmers would have to dig rows and plant the seeds by hand.

- Broadcasting: seeds are scattered on a random, non-row basis on top of the seedbed
- Row crop planting: require precise row spacing and even spacing of plants within the row planted in rows far enough apart to permit operation of machinery such as cultivators and harvesters
generally corn, soybeans, sorghum, vegetables & cotton
Drillers
A drill is an implement used to plant seeds for germination. The drill opens the soil, places the seeds, and covers the seeds. Drills can be used to plant seeds in plowed or unplowed land. Soybeans, wheat, oats, and rye grass are examples of crops that are commonly planted with drills.

Broadcasters
Use to broadcast seeds
Seed rate can be controlled
Can not control:
  In row and between row spacing
  planting depth
Several types:
  Pneumatic
  rotary disk

Rotary disk type broadcaster
Pneumatic broadcaster
**Parts of a Row seeder**

- Seeds container
- Agitator
- Seeds metering mechanism
- Seed tube
- Furrow opener
- Furrow closes
- Ground wheel

**Seed tube**

It takes seeds from S.M.M. to furrow opener

Mostly seed tubes are transparent and light weight

Types:
- Bellow
- Telescopic plane

**Bellow type seed tube**  **Telescopic type seed tube**

**Plain seed tube**
**Furrow opener**

Help to open the furrow

Types:
- Sword
- Angle iron
- Backward incline knife
- Concave disk
- Double disk

**Furrow closer**

Help to close the furrow

Types:
- Chain type
- Inverted ‘T’ closer
- Double conical wheels

**Compacting wheels**

Help to compact the soil of closed furrow

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**Seed metering mechanisms**

Seed metering has two aspects

1. Seed Metering rate – number of seeds released per unit time – related to final plant population.

2. Singular seed releasing ability – help to placement of seeds at uniform spacing in each row.
Types of SMM

• Bulk flow mechanisms
• Single seed metering mechanisms

Bulk flow mechanisms:

1. Fixed orifice seed metering mechanisms:
   It is difficult to get the required orifice size
2. Variable orifice SMM:
   should select the suitable seed size
3. Fluted roller SMM:
4. Belt type SMM:
   A conveyor belt carries the seeds from the hopper to seed tube
5. Cup feed SMM
   Seed rate can be adjusted with the rotational speed of cup plate

Single seed metering mechanisms

1. Vertical plate SMM
   Has a seed plate with openings that rotates.
   Seed plate turns, seeds fall into openings.
   One kernel/seed at a time if proper size is selected.
   Seed plates have to be changed to match seed size.

2. Inclined plate SMM
3. Horizontal plate SMM

4. Seed tape

5. Pneumatic type SMM
6. Finger pickup SMM
   Eliminates changing of plates.
   Fingers pickup individual kernels.
   Has spring loaded fingers that open & close by a cam as they rotate.
   Fingers select one individual kernel/seed.
   Delivers it to the discharge tube.
   Goes to the seed placement mechanism.

7. Brush-Type SMM

**Seeders**

- Low land seeders
  - Johan Pulley seeder
  - Dias dibber
  - Wickramasekara seeder
  - FMRC low land seeder
  - Power operated seeders

- Up land seeders
  - Single row push type seeder
  - FMRC high land seeder
  - Power operated seeders
John Pulley seeder

- Use to sowing pre-germinate seed
- Pull type, one man can operate
- 4 kg weight
- Working capacity is 0.05 ha/hr
- Couldn’t control the space and planting depth

Dias dibber

- In row space can be controlled
- Two men are required to operate
- The seeder is raised by men and put another place

Wickramasekara seeder

- Power requirement – 01 man
- Manual and pulling type
- Working capacity 0.1ha/hr
**FMRC low land seeder**

- Use to sowing pre-germinate seed in rows
- No of rows: 04
- Seed rate: 30 kg/Ac
- Field capacity: 2.5ha/day
- Power source: Manual (one man)

**Power operated lowland seeders**

**Single row push type seeder**

- Power source: manual (one man)
FMRC high land seeder

- Row seeding
- Pulling type
- No of rows: 02
- Spacing: variable from 200mm to 600mm
- Field capacity: 0.5 – 1.0 ha/day
- Power source: manual (one man)

Calibration of seeder

Why calibration is need?

- Because of usage, some parts may wear
- They should adjusted/replaced

Objectives of seeder calibration

1. To check the accuracy of the seeding rate
2. To correct the seeding rate

Types of calibration

1. Stationary calibration
   Mostly use for seeders
   The number of seed per 10 or 15 rounds of rotation of the ground wheel is counted
   Using the circumference of wheel determine the distance of row
   Calculate in row space
   Distance between adjacent seed tube = between raw space
   Calculate seed rate
   Adjust the SMM
2. Field calibration

Example

A three row maize seeder is going to be calibrated before use at the field. The radius of the ground wheel of the seeder is 14 cm and the single seed metering mechanism is fitted to the axel of the ground wheel. The expected between and within row spacing of the seeder are 60 cm and 30 cm respectively. How many seeds should be collected with 15 rotation of the ground wheel?
Trasplanters

Some crops such as rice require specialized planters to help place plants in the field. The following types are available:

1. Mark II trasplanter
2. Self-propelled trasplanter

1. Mark II trasplanter

2. Self-propelled trasplanter